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THE DEGREE OF FINANCIAL INTEGRATION IN THE EUROPEAN COMMUNITY

BY

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1 INTRODUCTION

The aim of this article is to measure the degree of financial integration in the European Community (EC) and how this changes over time. We identify financial integration in the EC with the cross-country integration of money and capital markets of EC member states.[1] Figure 1 gives a schematic overview of the financial relationships which exist between financial markets in the EC. A geographical criterion and a maturity criterion structure these financial relationships. The geographical criterion splits financial markets into domestic financial markets, Euromarkets and foreign financial markets. The maturity criterion splits financial assets into assets with a short-term and a long-term maturity. Short-term debt instruments (maturity of less than one year) are traded in the money market. Long-term debt instruments and equity instruments are traded in the capital market. We assume that countries A and B are EC member states. Financial assets are denominated in currency A or B.

Only the integration between domestic financial markets of countries A and B ('←1→' and '←2→') constitutes financial integration in the EC. The integration between domestic financial markets and Euromarkets ('←3→' and '←4→') implies integration between domestic financial markets and world financial markets. Both the integration between financial markets within EC countries ('↕') and the integration between the Euromarkets in question ('←5→' and '←6→') do not imply financial integration in the EC because transactions do not cross national borders of EC countries. The notion of financial integration is closely related to the notion of capital mobility. In

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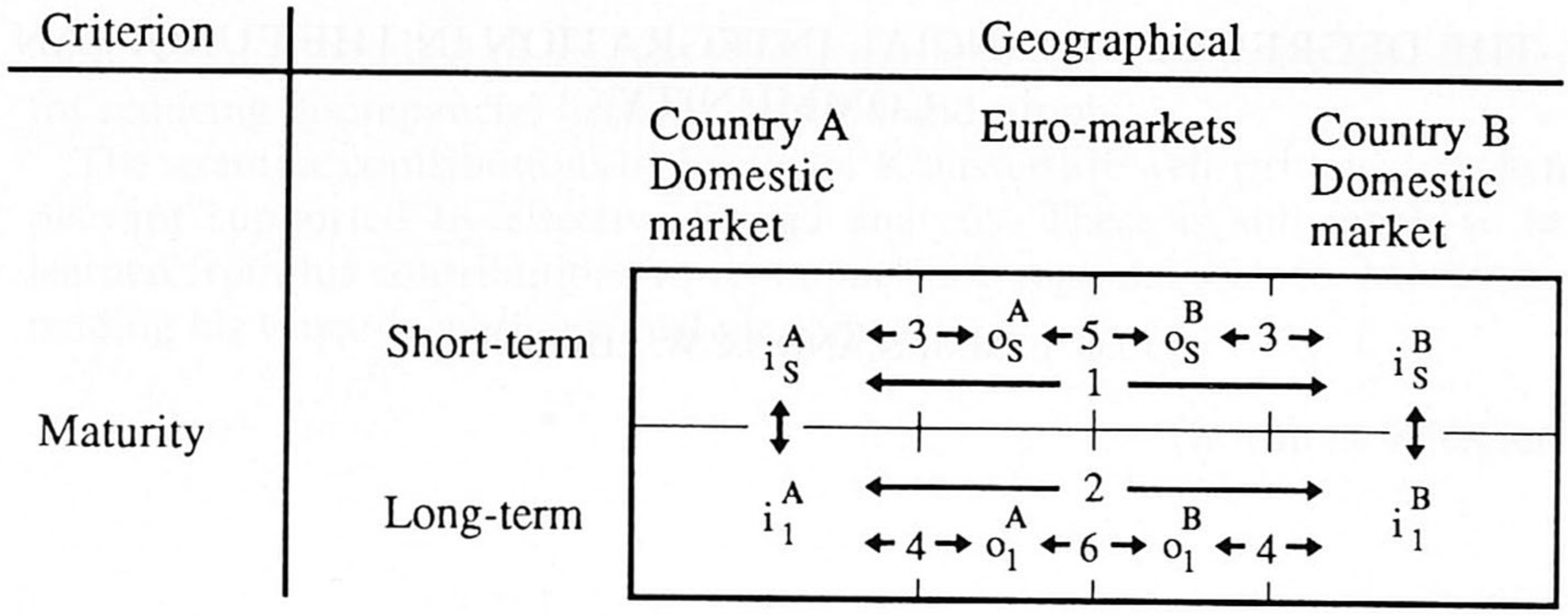
1 According to the Cecchini Report (1988), financial integration also covers the right of establishment and the provision of financial services, including banking, insurance and securities.



with:

i_s^A = short-term interest rate domestic money market country *A*
i_s^B = short-term interest rate domestic money market country *B*
i_l^A = long-term interest rate domestic capital market country *A*
i_l^B = long-term interest rate domestic capital market country *B*
o_s^A = 'off shore' interest rate eurocurrency market, financial assets denominated in currency *A*
o_s^B = 'off shore' interest rate eurocurrency market, financial assets denominated in currency *B*
o_l^A = 'off shore' interest rate eurocapital market, financial assets denominated in currency *A*
o_l^B = 'off shore' interest rate eurocapital market, financial assets denominated in currency *B*

Figure 1 – Financial markets and financial relationships in the EC

section 2 particular attention is given to four different definitions of perfect capital mobility.

2 FOUR DIFFERENT DEFINITIONS OF PERFECT CAPITAL MOBILITY

Frankel (1989) sets out an ascending order of four different definitions of perfect capital mobility according to their cumulative assumptions. Table 1 summarizes these four different definitions which correspond to four different criteria.

The first criterion – covered nominal interest parity (CIP) – examines perfect capital mobility of type I. If CIP holds the forward premium or discount (fd_t) equals the nominal interest differential at the appropriate maturity ($i_t - i_t^*$). Perfect capital mobility of type I means that the covered nominal interest differential ($i_t - i_t^* - fd_t$) is zero. CIP requires a zero country premium ($i_t - i_t^* - fd_t = 0$). The second criterion – *ex ante* uncovered nominal interest parity (UIP) – examines perfect capital mobility of type II or, in other words, perfect capital substitutability. If UIP holds the expected nominal exchange rate change (Δs_t^e) equals the nominal interest differential at the appropriate maturity ($i_t - i_t^*$). Perfect capital mobility of type II means that the *ex ante* uncovered nominal interest differential ($i_t - i_t^* - \Delta s_t^e$) is zero. UIP requires an additional assumption to CIP, *i.e.* a zero exchange risk premium ($fd_t - \Delta s_t^e = 0$). The third

TABLE 1 – FOUR DIFFERENT DEFINITIONS OF PERFECT CAPITAL MOBILITY, THEIR CORRESPONDING CRITERIA AND THEIR CUMULATIVE ASSUMPTIONS

I Covered nominal interest parity
$i_t - i_t^* - fd_t = 0$
Assumption:
1: $i_t - i_t^* - fd_t = 0$
Covered nominal interest parity plus zero exchange risk premium ($fd_t - \Delta s_t^e = 0$) leads to

II *Ex ante* uncovered nominal interest parity
$i_t - i_t^* - \Delta s_t^e = 0$
Assumptions:
1: $(i_t - i_t^* - fd_t) = 0$
2: $(fd_t - \Delta s_t^e) = 0$
Ex ante uncovered nominal interest parity plus zero expected real exchange rate change ($\Delta s_{rt}^e = 0$) leads to

III *Ex ante* real interest parity
$E(r_t - r_t^*) - \Delta s_{rt}^e = 0$
Assumptions:
1: $(i_t - i_t^* - fd_t) = 0$
2: $(fd_t - \Delta s_t^e) = 0$
3: $\Delta s_{rt}^e = \Delta s_t^e - \mathrm{E}(p_t - p_t^*) = 0$
Ex ante real interest parity plus zero correlation between all other variables that affect the gross domestic investment ratio [μ_i] other than the *ex ante* real interest rate [r_{ti}], and the gross national savings ratio [$Cov(\mu_i,(S_t/Y_t)_i) = 0$] plus zero correlation between the expected real foreign interest rate and the gross national saving ratio [$Cov(E(r_t^*), (S_t/Y_t)_i) = 0$] leads to

IV The Feldstein-Horioka condition: no correlation between the gross national savings ratio $(S_t/Y_t)_i$ and the gross domestic investment ratio $(I_t/Y_t)_i$
$(I_t/Y_t)_i = \alpha + \beta(S_t/Y_t)_i + \varepsilon_i$
Assumptions:
1: $(i_t - i_t^* - fd_t) = 0$
2: $(fd_t - \Delta s_t^e) = 0$
3: $\Delta s_{rt}^e = \Delta s_t^e - E(p_t - p_t^*) = 0$
} $Cov(E(r_{ti} - r_t^*),(S_t/Y_t)_i) = 0$
4: $Cov(\mu_i,(S_t/Y_t)_i) = 0$
5: $Cov(E(r_t),(S_t/Y_t)_i) = 0$

criterion – *ex ante* real interest parity (RIP) – examines perfect capital mobility of type III or, in other words, perfect financial and non-financial capital mobility. Non-financial capital mobility refers to the mobility of goods and services and the mobility of the production factors labour and physical capital. If RIP holds the expected real exchange rate change (Δs_{rt}^e) equals the *ex ante* real interest differential at the appropriate maturity $E(r_t - r_t^*)$. RIP requires not only UIP but also a zero expected real exchange rate change ($\Delta s_{rt}^e = 0$). The fourth criterion – the Feldstein-Horioka (F-H) condition – examines perfect capital

mobility of type IV. The F-H condition infers from the correlation between the savings and investment ratios the degree of capital mobility of type IV. The F-H condition requires two additional assumptions to the RIP condition and is therefore the strongest criterion for financial integration.

To obtain a more comprehensive perspective on the degree of financial integration in the EC all four criteria are used to assess the degree of financial integration. We slightly prefer the CIP and the UIP condition to assess the degree of financial integration because the CIP and the UIP condition assess two important theoretical aspects of financial integration *i.e.* the *ability* and the *willingness* to move financial assets across national borders in response to expected differences in exchange-adjusted returns (see for example Boothe *et al.* 1985, Caramazza *et al.* 1986, Akhtar and Weiller 1987, Reinhart and Weiller 1987a). Two assets are substitutable if investors are willing to change relative shares of their portfolio in response to a change in expected relative returns. Whether asset stocks actually change depends on the ability of investors to adjust their portfolios.[2] The CIP condition examines the ability of capital movements while the UIP condition examines the willingness of capital movements. The RIP and the F-H condition, however, not only measure the degree of financial integration but also the degree of real integration and therefore have less explanatory power with respect to the degree of financial integration. The first three criteria in Table 1 rely on the co-movement of domestic and foreign *prices* (*i.e.* interest rates) and fit into the price approach. Criterion IV, however, relies on the co-movement of domestic *quantities* and fits into the quantity approach. The remainder of this article is organized as follows. The quantity approach is examined in section 3 and the price approach is examined in section 4. Section 5 concludes the article.

3 THE QUANTITY APPROACH

3.1 *The Feldstein-Horioka Condition and Cross-section Analysis*

In 1980 F-H asserted that one could deduce from the national accounting framework the degree of financial integration. F-H asserted that changes in gross national savings and/or gross domestic investment resulted in changes in the current account balance. Assuming that the capital account balance is the opposite of the current account balance they concluded that the degree of financial integration had changed. The F-H condition for testing the degree of financial integration with cross-section data can be specified as follows:

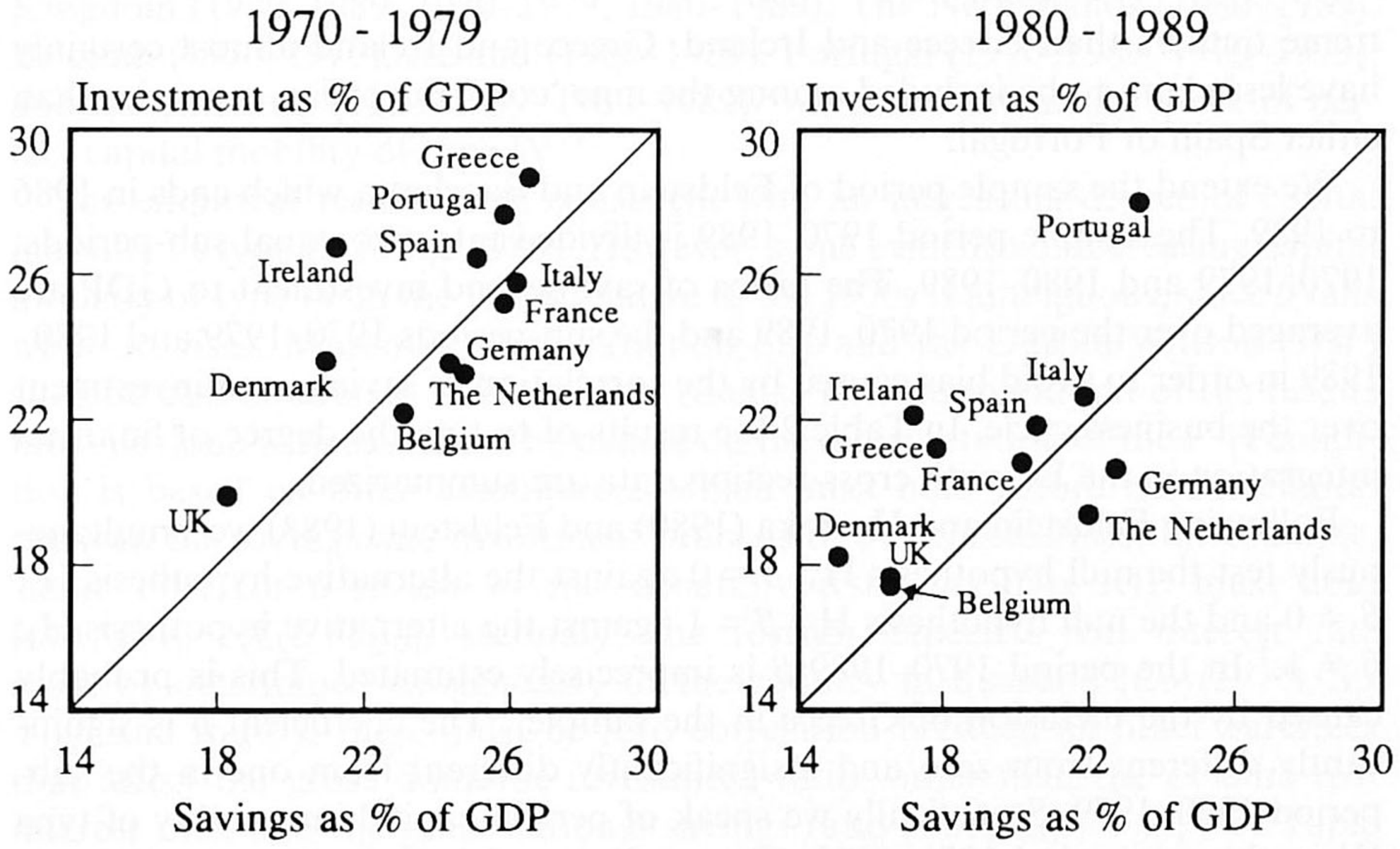
$$(I_t/Y_t)_i = \alpha + \beta(S_t/Y_t)_i + \varepsilon_i \qquad (1)$$

2 Akhtar and Weiller (1987, p. 19) argue: 'In practice, componants of rates of return, *e.g.* exchange rates, may adjust quickly without actual movements of capital, that is capital mobility may be just incipient.'

where ε stands for the error term, i stands for the country index and t stands for the sample period. F-H convert gross national savings (S_t) and gross domestic investment (I_t) into relative form by dividing by gross domestic product (Y_t). The data are taken from the National Accounts of OECD countries (see data appendix).

Feldstein and Bacchetta (1989) first estimated the standard cross-section specification of the F-H condition in level form for a sample of nine EC countries with ordinary least squares (OLS). The cross-section data are plotted in Figure 2. Figure 2 is a first illustration of the relationships subsequently found by OLS-estimation of the F-H condition. An observation on the 45°-line indicates that the country's current account is balanced. An observation above the 45°-line reflects a current account deficit *i.e.* the country's domestic investment exceeds its supply of national savings and the country is a net borrower in the international capital market (Tesar 1991, p. 61).

Cross-section analysis may not be useful if there are significant differences between the correlation of savings and investment ratios in EC countries. This is why Feldstein and Bacchetta probably exclude the last EC entrants Spain and Portugal (assuming high correlation) and Luxembourg (assuming low correlation). Figure 2, however, shows that Portugal and Spain are less ex-



Source: OECD (1991), National Accounts of OECD Countries, Main Aggregates 1960–1989, Volume I.

Figure 2 – $(S_t/Y_t)_i$ *versus* $(I_t/Y_t)_i$ for EC member states (excluding Luxembourg), averages during the period 1970–1979 and the period 1980–1989[a]

[a]Luxembourg lies outside the range of this graph.

TABLE 2 – THE F-H CONDITION AND CROSS-SECTION ANALYSIS OF NINE EC MEMBER STATES (EXCLUDING SPAIN, PORTUGAL AND LUXEMBOURG):

$$(I_t/Y_t)_i = \alpha + \beta(S_t/Y_t)_i + \varepsilon_i$$

Period *(t)*	$\hat{\alpha}$	$\hat{\beta}$	R^2	$Cor[(S_t/Y_t)_i, (I_t/Y_t)_i]$
1970–1989	0.1286	0.4441†	0.2876	0.5363
	(0.0561)	(0.2641)		
1970–1979	0.1037	0.6032	0.4473	0.6688
	(0.0595)	(0.2534)		
1980–1989	0.1339	0.3504*	0.2597	0.5096
	(0.0425)	(0.2236)		

* indicates that the coefficient β is insignificantly different from zero and significantly different from one at the 5% level of significance.

† indicates that the coefficient β is imprecisely estimated and differs insignificantly from zero and insignificantly from one at the 5% level of significance.

Standard errors are indicated in parentheses.

Source: OECD (1991), National Accounts of OECD Countries, Main Aggregates 1960–1989, Volume I.

treme outliers than Greece and Ireland. Greece and Ireland almost certainly have less claim to be included among the nine 'core' European countries than either Spain or Portugal.

We extend the sample period of Feldstein and Bacchetta which ends in 1986 to 1989. The sample period 1970–1989 is divided into two equal sub-periods: 1970–1979 and 1980–1989. The ratios of savings and investment to GDP are averaged over the period 1970–1989 and the sub-periods 1970–1979 and 1980–1989 in order to avoid bias caused by the correlation of savings and investment over the business cycle. In Table 2 the results of testing the degree of financial integration in the EC with cross-section data are summarized.

Following Feldstein and Horioka (1980) and Feldstein (1983) we simultaneously test the null hypothesis $H_0: \beta = 0$ against the alternative hypothesis $H_1: \beta \neq 0$ and the null hypothesis $H_0: \beta = 1$ against the alternative hypothesis $H_1: \beta \neq 1$.[3] In the period 1970–1989 β is imprecisely estimated. This is probably caused by the inclusion of Greece in the sample.[4] The coefficient β is significantly different from zero and insignificantly different from one in the sub-period 1970–1979. Statistically we speak of perfect capital immobility of type IV in the sub-period 1970–1979. The coefficient β is insignificantly different

3 Obstfeld (1986, p. 66) argues: 'Since the least-square estimate of β is not, strictly speaking, a correlation coefficient, there is no reason for it to be less than 1.'

4 Greece is the only EC member state for which national accounting definitions of savings and investment are based on the earlier S.N.A. definitions (see data appendix).

from zero and significantly different from one in the sub-period 1980–1989. We can statistically speak of perfect capital mobility of type IV in the sub-period 1980–1989 although it is questionable if all assumptions underlying the F-H test are met (see section 3). This result differs from the result obtained for the period 1980–1986 by Feldstein and Bacchetta. The inclusion of three more years in the sample period results in a higher degree of capital mobility of type IV in the sub-period 1980–1989.[5] This result is also illustrated in Figure 2 by the greater dispersion of points around the 45°-line in the sub-period 1980–1989 relative to the sub-period 1970–1979.

3.2 *The Feldstein-Horioka Condition and Time-series Analysis*

The F-H condition for testing the degree of financial integration with time-series data can be specified as follows:

$$(I_i/Y_i)_t = \alpha + \beta(S_i/Y_i)_t + \varepsilon_t \qquad (2)$$

In Table 3 the results of testing the degree of financial integration of individual EC member states with time-series data are summarized.

The coefficient β is insignificantly different from zero and significantly different from one in the following countries: Germany (1980–1989), the United Kingdom (1970–1989, 1970–1979, 1980–1989), The Netherlands (1980–1989), Belgium (1970–1979), Ireland (1980–1989), Portugal (1970–1989, 1970–1979), and Luxembourg (1970–1989, 1980–1989). We then statistically speak of perfect capital mobility of type IV.

The empirical results seem consistent with an increasing degree of capital mobility of type IV in the 1980s. However, some evidence of increasing capital mobility of type IV in the 1980s relative to the 1970s is ambiguous, since $\hat{\beta}$ falls while R^2 rises. Moreover, time variation of $\hat{\beta}$ and the Durbin-Watson (DW) statistic cast doubts on the empirical results. The interpretation of the results must be done with caution. The debate on the interpretation of the F-H condition is based on three assumptions which must hold before no correlation between the savings and investment ratios is to be expected (see, for example, Tesar 1991 for a review of this debate). Firstly, *ex ante* RIP must hold $[Cov(E(r_{ti}-r^*_t),(S_t/Y_t)_i)]$, secondly, the foreign expected real interest rate must be determined exogenously to the country in question $[Cov(E(r^*_t),(S_t/Y_t)_i)]$ and thirdly, there must be zero correlation between all other variables that affect the gross domestic investment ratio, other than the *ex ante* real interest rate, and the gross national savings ratio $[Cov(\mu_i,(S_t/Y_t)_i)]$ (see Table 1).[6] We briefly place these three assumptions in a European context.

With reference to the first assumption: *Imperfect financial and/or non-finan-*

5 In the real world, of course, the degree of capital mobility lies somewhere between perfect capital mobility and perfect capital immobility of a particular type.

6 Dooley *et al.* (1987, p. 505) assume the investment equation to be linear: $(I_t/Y_t)_i = \gamma - \Phi E(r_{ti}) + \mu_i$.

TABLE 3 – THE F-H CONDITION AND TIME-SERIES ANALYSIS OF TWELVE EC MEMBER STATES: $(I_i/Y_i)_t = \alpha + \beta(S_i/Y_i)_t + \varepsilon_t$

Period (t)	$\hat{\alpha}$	$\hat{\beta}$	R^2	DW	$Cor[(S_i/Y_i)_t, (I_i/Y_i)_t]$
Germany					
1970–1989	0.0428	0.7570	0.5282	0.3203	0.7268
	(0.0398)	(0.1686)			
1970–1979	−0.0103	1.0068	0.8908	1.5013	0.9438
	(0.0305)	(0.1246)			
1980–1989	0.1988	0.1988*	0.0032	0.8196	0.0569
	(0.0491)	(0.2159)			
UK					
1970–1989	0.1674	0.1125*	0.0106	0.6365	0.1028
	(0.0446)	(0.2564)			
1970–1979	0.2115	−0.0672*	0.0151	2.1237	−0.1227
	(0.0348)	(0.1921)			
1980–1989	0.3932	−1.3160*	0.3542	1.4884	−0.5952
	(0.1046)	(0.6283)			
France					
1970–1989	0.0288	0.8759	0.9242	1.7873	0.9613
	(0.0138)	(0.0591)			
1970–1979	0.0051	0.9641	0.7388	2.1148	0.8596
	(0.0526)	(0.2027)			
1980–1989	−0.0026	1.0343	0.8139	1.0859	0.9021
	(0.0356)	(0.1749)			
The Netherlands					
1970–1989	0.0270	0.8024	0.5437	0.5045	0.7374
	(0.0407)	(0.1733)			
1970–1979	0.0783	0.6318	0.5110	0.5578	0.7148
	(0.0540)	(0.2185)			
1980–1989	0.1365	0.2650*	0.1022	1.0890	0.3196
	(0.0616)	(0.2778)			
Italy					
1970–1989	0.0484	0.8134	0.6277	1.5003	0.7923
	(0.0354)	(0.1477)			
1970–1979	0.1048	0.5906†	0.0998	1.6021	0.3160
	(0.1630)	(0.6270)			
1980–1989	−0.0687	1.3579	0.8203	1.4364	0.9057
	(0.0490)	(0.2247)			
Belgium					
1970–1989	0.0642	0.6882‡	0.6886	0.5261	0.8298
	(0.0219)	(0.1091)			
1970–1979	0.1635	0.2768	0.3162	1.7891	0.5623
	(0.0329)	(0.1439)			
1980–1989	0.1051	0.4077†	0.1872	0.5017	0.4326
	(0.0503)	(0.3003)			

TABLE 3 – CONTINUED**

Period (t)	$\hat{\alpha}$	$\hat{\beta}$	R^2	DW	$Cor[(S_i / Y_i)_t, (I_i / Y_i)_t]$
Ireland					
1970–1989	0.1764	0.3581†	0.0461	0.4082	0.2147
	(0.0739)	(0.3841)			
1970–1979	0.3647	−0.4552†	0.0522	0.7022	−0.2286
	(0.1459)	(0.6855)			
1980–1989	0.5257	−1.8031*	0.3967	0.9513	−0.6298
	(0.1333)	(0.7861)			
Spain					
1970–1989	0.0200	0.9695	0.6346	0.7680	0.7966
	(0.0400)	(0.1734)			
1970–1979	0.1014	0.6580†	0.2489	0.8112	0.4989
	(0.1016)	(0.4042)			
1980–1989	0.0732	0.6959†	0.2202	0.4855	0.4693
	(0.0960)	(0.4630)			
Denmark					
1970–1989	0.575	0.8528	0.8777	1.6886	0.9369
	(0.0136)	(0.0750)			
1970–1979	0.1099	0.6120‡	0.6910	2.6182	0.8313
	(0.0303)	(0.1447)			
1980–1989	0.0531	0.8662	0.5875	1.2872	0.7665
	(0.0380)	(0.2566)			
Portugal					
1970–1989	0.2467	0.1358*	0.0531	0.5638	0.2303
	(0.0343)	(0.1352)			
1970–1979	0.2492	0.1139*	0.2211	0.8388	0.4702
	(0.0205)	(0.0756)			
1980–1989	0.1906	0.3899†	0.0585	0.5017	0.2418
	(0.1300)	(0.5532)			
Greece					
1970–1989	0.0797	0.7750†	0.9166	1.6390	0.9574
	(0.0126)	(0.0551)			
1970–1979	0.0144	1.0329	0.8818	1.7638	0.9390
	(0.0356)	(0.1337)			
1980–1989	0.1074	0.5991†	0.8381	1.7001	0.9155
	(0.0170)	(0.0931)			
Luxembourg					
1970–1989	0.2834	−0.0701*	0.0767	1.3187	−0.2770
	(0.0293)	(0.0573)			
1970–1979	0.5227	−0.6460†	0.4408	1.9036	−0.6639
	(0.1090)	(0.2572)			
1980–1989	0.3009	−0.0930*	0.1507	1.9987	−0.3881
	(0.0458)	(0.0781)			

**Explanation on p. 198.

cial capital mobility, which means $Cov(E(r_{ti}-r^*_t),(S_t/Y_t)_i) \neq 0$. It is very difficult to infer from the F-H results something about the degree of capital mobility of type I or II (which we prefer) because EC restrictions on labour mobility, physical capital mobility or on trade in goods and services markets cause positive correlation between the savings and investment ratios. Another disadvantage of the F-H condition is that it examines *net* financial and non-financial capital mobility. *Gross* financial and non-financial capital mobility may well be higher. Furthermore, the F-H condition not only measures the degree of capital mobility of type IV between EC member states but also between EC member states and abroad which of course also include countries like the United States and Japan. The F-H condition is also more indicative of capital market integration than of money market integration because investment and savings decisions are usually made with a fairly long-time horizon. An advantage of the F-H condition is that it considers all (long-term) capital flows that result from trade in shares and in (long-term) bonds. An interest parity condition only considers a segment of a financial market which corresponds to bonds with a specific maturity.

With reference to the second assumption: *The foreign expected real interest rate is endogenous, which means* $Cov(E(r^*_t),(S_t/Y_t)_i) \neq 0$. Small countries take the world interest rate as given, while changes in savings and investment behaviour of large countries will have an impact on the world interest rate (Tesar 1991, p. 68). The degree of capital mobility of type I, II and III is probably higher for certain countries such as Germany, France and Italy than the degree of capital mobility of type IV. Harberger (1980) argues that in small unidirectional countries savings and investment shocks do not compensate each other while in large diversified countries this does happen. Differences between savings and investment are therefore greater in small countries than in large countries. These greater differences, however, do not mean that the degree of capital mobility of type IV is higher (look for example at Greece and Portugal).

With reference to the third assumption: S_t *and* I_t *are endogenous, which means* $Cov(\mu_i,(S_t/Y_t)_i) \neq 0$. Table 3 also includes the DW statistic. We test the null hypothesis that no serial correlation is present (H_0: $\rho = 0$) against the

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Explanation of Table 3:

* indicates that the coefficient β is insignificantly different from zero and significantly different from one at the 5% level of significance.

† indicates that the coefficient β is imprecisely estimated and differs insignificantly from zero and insignificantly from one at the 5% level of significance.

‡ indicates that the coefficient β is imprecisely estimated and differs significantly from zero and significantly from one at the 5% level of significance.

Standard errors are indicated in parentheses.

Source: OECD (1991), National Accounts of OECD Countries, Main Aggregates 1960–1989, Volume I.

alternative hypothesis that positive or negative serial correlations are present (H_1: $\rho \neq 0$). Table 3 shows that the equation $(I_i/Y_i)_t = \alpha + \beta(S_i/Y_i)_t + \varepsilon_t$ is not always for every country and for every period the correct model because of positive serial correlation. The exclusion of important independent variables may cause positive serial correlation. The exclusion of important independent variables may cause positive serial correlation. However, introducing new variables would frustrate the essence of the F-H condition which is based on an accounting framework. On the other hand, it is this accounting framework and the lack of a good structural underlying model in which the relationships between savings, investment and capital mobility are specified which presents a serious problem (Mishkin 1986, p. 70). Positive serial correlation together with OLS underestimates standard errors and thus overestimates *t*-statistics. We tend to erroneously reject the null hypotheses while the null hypotheses are true. Spain and Portugal show structural positive serial correlation for each period considered. Positive serial correlation may also cause imprecise estimates of the coefficient β. The problem of serial correlation is closely connected with the endogeneity problem in cross-section and especially in time-series analyses. Even with perfect capital mobility of type III savings and investment ratios may be positively correlated because of private sector and public sector behaviour. Dooley *et al.* (1987, p. 508) argue: '*Any* economic variable, in addition to the cost of capital that influences the investment rate, will probably be correlated with the national saving rate.' Endogenous savings and investment make the use of OLS inappropriate. An econometric solution to the endogeneity problem is offered by the use of instrumental variables. However, the results of these 2SLS-estimates do not particularly differ from OLS-estimates because it is difficult to identify suitable instruments. Summing up, the above problems make the F-H condition less suitable for measuring the degree of financial integration.

4 THE PRICE APPROACH

4.1 *Money Market Integration*

Short-term interest correlations

This section focuses on the price approach. The price approach stresses that price convergence and parallel price development are important manifestations of financial integration. Firstly, we examine money market integration by calculating correlation coefficients between representative money market interest rates of EC member states. Luxembourg is excluded from the sample because Luxembourg and Belgium form a monetary union. We cannot measure money market integration between Belgium and Luxembourg because only one Belgium-Luxembourg short-term interest rate exists. The monthly data are nominal short-term interest rates which are considered representative of the money market situation in EC member states by international organisations

such as the OECD and the IMF (see data appendix).[7] Money market integration will cause close linkages between representative nominal short-term interest rates of EC member states. Table 4 shows cross-correlation coefficients between EC member states during the period January 1981 to December 1990.[8]

A useful way of examining the degree of financial integration between EC member states is to compare their correlation coefficients with Germany because Germany forms the anchor of the European Monetary System (EMS). The correlation coefficient between The Netherlands and Germany is very high. The short-term interest rate of Belgium, France and the United Kingdom also shows a high correlation with that of Germany. The correlation coefficients of Ireland, Denmark, Italy, Greece, Spain, and Portugal with respect to Germany are lower. As can be seen in Table 4 the correlation coefficient between countries with open money markets is relatively high (Germany, The Netherlands, Belgium, France, and the United Kingdom). Intuitively, we might expect countries with open financial markets to show relatively high correlation coefficients. The correlation coefficients between countries with closed money markets and countries with open money markets are relatively low (Italy, Denmark, Greece, Ireland, Spain, and Portugal).

The period January 1981 to December 1990 incorporates the European Commission directive of 24 June 1988 which stated that from 1 July 1990 all short-term and long-term capital movements in the EC were to be free of restrictions.[9] However, Greece, Ireland, Spain, and Portugal do not have to fulfil this directive until 31 December 1992. Moreover, Portugal and Greece have the possibility of postponing implementation of this directive till 31 December 1995. In practice this means that especially restrictions on short-term capital movements have to disappear (many restrictions on long-term capital movements had already been lifted earlier).

Of course, correlation coefficients must be interpreted very carefully. Not all of the synchronous movement of interest rates can be attributed to integration of financial markets. The linkages between interest rates depend for a large part on the form of the exchange rate regime and the way in which exchange rate expectations are formed. In the Exchange Rate Mechanism (ERM) of the EMS with stable exchange rates, there is a presupposition that increased capi-

7 Quoting the OECD (1990c, p. 45): '(...) the aim has not necessarily been to take the same rate for all countries, but to choose the rates which are the most typical or the most revealing, or again, those which may be described as the 'reference' rates. In drawing up the following norms, while attention has, of course, been given to ensuring as much international comparability as possible, it has nevertheless been necessary to have regard for the fact that the methods of calculation used by countries to some extent reflect the institutional features of their financial markets.'

8 With the reservation of data availability.

9 The first stage of the European Economic and Monetary Union (EMU) started on 1 July 1990.

TABLE 4 – CORRELATIONS AMONG REPRESENTATIVE NOMINAL SHORT-TERM INTEREST RATES OF EC MEMBER STATES DURING THE PERIOD JANUARY 1981 TO DECEMBER 1990 (EXCLUDING PORTUGAL AND LUXEMBOURG)

	Ger	UK	Fra	NL	Ita	Bel	Ire	Spa	Den	Gre
Ger	1.0000									
UK	0.6735	1.0000								
Fra	0.7794	0.3152	1.0000							
NL	0.9618	0.7325	0.7233	1.0000						
Ita	0.5608	0.1144	0.8747	0.4805	1.0000					
Bel	0.8245	0.3957	0.9286	0.7557	0.8893	1.0000				
Ire	0.5763	0.2772	0.8078	0.5551	0.8382	0.8397	1.0000			
Spa	0.2946	−0.0456	0.5246	0.2439	0.4365	0.3380	0.3183	1.0000		
Den	0.5552	0.1740	0.7283	0.4720	0.6288	0.7187	0.6416	0.2917	1.0000	
Gre	0.3699	0.4296	0.1443	0.4046	0.1194	0.2606	0.2539	−0.0978	0.1223	1.0000

Note: Correlation Greece during the period January 1982 to December 1990. No data were available for Portugal.

Source: see data appendix.

tal mobility will induce interest rates to move closely together.[10] High correlation coefficients may represent the convergence of monetary policies in the 1980s or, more precisely, the convergence of monetary policy objectives in the EC. Monetary policies were used intensively to fight inflation in most of the industrial countries and may cause interest rates to move together. Dutch monetary authorities, for example, use the nominal short-term interest rate as a policy instrument to maintain a stable exchange rate with respect to the DM.[11] Furthermore, high correlation coefficients may also be provoked by economic agents reacting to the same news.

Short-term interest differentials

Table 5, calculated by the European Commission (1990, p. 160) on the basis of Frankel (1989) examines all four types of capital mobility which were presented in Table 1. The European Commission transformed the mean deviation from *ex post* real interest parity relative to the United States which was calcu-

10 EC member states which participate in the ERM of the EMS are: Belgium, Denmark, Germany, France, Ireland, Italy, France, The Netherlands and Luxembourg (as of 13 March 1979), Spain (as of 16 June 1989), the United Kingdom (as of 8 October 1990), and Portugal (as of 6 April 1992). Belgium, Denmark, Germany, France, Ireland, The Netherlands and Luxembourg have a fluctuation margin of ± 2.25%, Italy ± 6% and as of 8 January 1990 ± 2.25%, Spain, the United Kingdom and Portugal ± 6%.

11 The nominal long-term interest rate is not an instrument of monetary policy. Capital markets are dominated more by market forces.

TABLE 5 – *EX POST* MEASURES OF SHORT-TERM CAPITAL MOBILITY OF EC MEMBER STATES RELATIVE TO GERMANY, AVERAGES OF MONTHLY OBSERVATIONS DURING THE PERIOD SEPTEMBER 1982 TO APRIL 1988[a]

	Covered nominal interest parity (CIP) (1)	Exchange risk premium (2)	Uncovered nominal interest parity (UIP) (3)=(1)+(2)	Relative PPP deviation (4)	Currency premium (5)=(2)+(4)	Real interest parity (RIP) (6)=(1)+(5)
Belgium	−0.23	3.40	3.17	−1.34	2.08	1.82
Denmark	−3.88	3.39	−0.49	−1.59	1.80	−2.13
Greece	−9.74	−0.47	−10.21	4.53	2.49	−7.93
Spain	−2.75	4.87	2.12	0.34	4.78	1.82
France	−2.09	3.36	1.27	0.11	3.01	0.81
Ireland	−1.14	3.16	2.02	0.50	3.80	2.82
Italy	−0.75	4.66	3.91	−1.66	3.08	2.30
The Netherlands	−0.14	0.24	0.10	0.24	0.74	0.58
Portugal	−8.28	7.16	−1.12	−1.77	6.60	−2.61
United Kingdom	−0.49	−0.34	−0.83	3.51	2.27	1.75

(1) $i_t^* - fd_t$
(2) $fd_t - \Delta s_t^e$
(3) $i_t - i_t^* - \Delta s_t^e$
(4) $\Delta s_t^e - (p_t - p_t^*)$
(5) $fd_t - (p_t - p_t^*)$
(6) $i_t - p_t - (i_t - p_t^*)$

with:

fd_t = three-month forward discount with respect to the DM.
Δs_t^e = observed depreciation with respect to DM (proxy for expected value), three-month percentage change at annual rate
p_t = observed inflation (proxy for expected value) over three-month period at annual rate
i_t = money market interest rate over three-month period
* = refers to German variables

Note: The identities (6) = (1) + (5) and (5) = (2) + (4) are not always respected due to inconsistencies in the original data material.

[a]Some of the original calculations of the European Commission (1990, p. 160) have been corrected. The exchange risk premium of France is 3.36 instead of 3.35 and the exchange risk premium of The Netherlands is 0.24 instead of 0.26. Relative PPP deviation of The Netherlands is 0.24 instead of 0.26. The currency premium of Ireland is 3.80 instead of 4.80. Calculations of interest parity conditions are based on pre-tax returns.

Source: Calculated from Frankel (1989) by the European Commission (1990, p. 160).

lated by Frankel (1989) in the following way: $r-r_{Ger} = r-r_{US}-(r_{Ger}-r_{US})$. The mean deviation from *ex post* real interest parity is decomposed into a country premium, an exchange risk premium and a deviation from relative purchasing power parity (PPP) for the EC countries relative to Germany during the period September 1982 to April 1988.[12] Ideally, each of these factors should be zero for perfect capital mobility (of a particular type) to hold. Price expectations and exchange rate expectations have been proxied by their observed values on the basis of rational expectations.

The least stringent criterion for financial integration is the CIP condition (1). The covered nominal interest differential relative to Germany ($i_t-i_t^*-fd_t$) reflects the country medium. A negative country premium means that the domestic interest rate is artificially low compared to the German interest rate and barriers exist to discourage capital export into the other EC country.[13] According to Table 5 only the United Kingdom, The Netherlands and Belgium have small country premiums of not more than 50 basis points, probably only reflecting transaction costs. Greece and Portugal show high country premiums and clearly maintained many capital controls. A stronger criterion than the CIP condition is the UIP condition (3). According to Table 5 the smallest *ex post* uncovered nominal interest differential relative to Germany is that of The Netherlands. This points to a high money market integration between The Netherlands and Germany. The *ex post* uncovered nominal interest differential of the United Kingdom relative to Germany is also small. Deviations from *ex post* UIP may reflect a risk premium or irrational forecasts. De Boissieu (1988, p. 59) says this about deviations from *ex post* UIP: '(...) the inability of operators to forecast accurately the date and the extent of realignments may explain differences in the *ex post* returns on financial assets with the same maturity denominated in different currencies.' The RIP condition (6) is stronger than the UIP condition (3). According to the RIP condition perfect capital mobility of type III could only be said to exist between Germany and The Netherlands.

Of course it may be hazardous to measure the degree of money market integration by only looking at a few segments of domestic and foreign money markets. We consequently use another criterion which partially avoids this problem. Another criterion simply calculates the nominal short-term interest differential with representative nominal short-term interest rates. This interest differential is used as an approximation of the short-term *ex ante* uncovered nominal interest differential and assumes $\Delta s_t^e = 0$.[14] This approximation may be warranted for EC countries which participate in the ERM of the EMS. Bhandari and Mayer (1990) conclude in their article that exchange rate stability

12 Frankel and MacArthur (1988) first introduced the decomposition method of real interest differentials.

13 A recent status of capital controls in EC member states can be found in Kredietbank (1990). See also OECD (1990a) and OECD (1990b).

14 De Haan *et al.* (1991a) have shown that this assumption is probably not warranted.

achieved in the EMS has been an important factor in promoting capital mobility. Although some exchange rates of EMS countries are within a small band, the possibility of an exchange rate realignment in the EMS always influences nominal exchange rate expectations which cause nominal short-term (and long-term) interest rate divergences.

Table 6 shows the means and standard deviations of nominal short-term interest differentials of EC member states with respect to Germany during the period January 1981 to December 1990 and the sub-periods January 1981 to December 1985 and January 1986 to December 1990.

The nominal short-term interest differential of non-EMS countries (Greece and Portugal) and the nominal short-term interest differential of EMS countries with a broader band (Italy, Spain and the United Kingdom) are large. EMS countries with a generally smaller fluctuation margin have a smaller

TABLE 6 – NOMINAL SHORT-TERM INTEREST DIFFERENTIALS OF EC MEMBER STATES RELATIVE TO GERMANY (EXCLUDING LUXEMBOURG): MEANS AND STANDARD DEVIATIONS

	1981–1990	1981–1985	1986–1990
UK-Germany	5.13%	4.06%	6.20%
	(1.89)	(2.01)	(0.88)
France-Germany	4.08%	5.16%	3.01%
	(1.75)	(1.63)	(1.05)
The Netherlands-Germany	0.29%	−0.03%	0.61%
	(0.75)	(0.82)	(0.49)
Italy-Germany	8.34%	10.37%	6.32%
	(2.86)	(1.97)	(2.08)
Belgium-Germany	3.44%	4.54%	2.33%
	(1.60)	(1.25)	(1.07)
Denmark-Germany	4.65%	5.32%	3.99%
	(2.77)	(3.44)	(1.60)
Ireland-Germany	5.17%	6.13%	4.21%
	(2.49)	(2.16)	(2.41)
Spain-Germany	8.20%	8.27%	8.14%
	(3.16)	(3.86)	(2.23)
Portugal-Germany	–	–	7.72%
			(2.54)
Greece-Germany	11.77%[1]	10.95%[2]	12.43%
	(3.15)	(2.67)	(3.34)

[1]During the period January 1982 to December 1990
[2]During the period January 1982 to December 1985

Source: see data appendix

differential. The Netherlands has the smallest differential with respect to Germany.

The interpretation of the nominal short-term interest differential must be done with caution. In the ERM of the EMS short-term interest rates are also used as policy instruments to keep exchange rates within the bands of the EMS. Fukao and Hanazaki (1987, p. 75) argue: 'Under an actual adjustable peg system such as the EMS, the nominal interest rates are not equalised in the short run. This divergence of interest rates is due to the allowed margin of movements in the exchange rates and possible future changes in the parity rates.' We can tautologically decompose the causes of nominal interest rate divergences as follows: $i_t - i_t^* = (i_t - i_t^* - fd_t) + (fd_t - \Delta s_t^e) + \Delta s_t^e$. Growing exchange rate fluctuations influence the last two factors. This explains why the United Kingdom is not well integrated by this criterion while it is well integrated by the UIP condition.

In Table 6 we also examine changes in the degree of money market integration of EC member states by comparing the nominal short-term interest differentials of the sub-period January 1981 to December 1985 with the sub-period January 1986 to December 1990. The interest differential decreased for France, Italy, Belgium, Denmark, Ireland, and Spain. Just as we expected, these countries recently abolished their capital controls on short-term capital movements. Furthermore, the standard deviation of the nominal short-term interest differential declined in all EC countries except Italy and Greece.

4.2 *Capital Market Integration*

Long-term interest correlations

Table 7 shows cross-correlation coefficients between EC member states during the period January 1981 to December 1990. The monthly data are representative nominal long-term interest rates based on government bonds traded in the secondary market (see data appendix).

In the period January 1981 to December 1990 The Netherlands had the highest correlation coefficient with respect to Germany. The Netherlands is followed by Belgium, the United Kingdom and France. France is included in the group of countries with high capital market integration. Ireland, Denmark, Italy, and Spain also show a high correlation with respect to Germany. Portugal, Greece and Luxembourg show a lower correlation with respect to Germany.

Correlation coefficients among representative nominal long-term interest rates seem higher than among representative nominal short-term interest rates. This result is an indication of greater capital market integration than money market integration in the EC. This is remarkable because the currency exposure of long-term assets cannot be covered in the forward market. This suggests that capital mobility is significantly lower for capital market instruments as opposed to money market instruments. An explanation for this remarkable

result is that the liberalization of long-term capital movements started earlier than the liberalisation of short-term capital movements. The liberalisation of long-term capital movements started as early as 17 November 1986 when the European Commission enacted a directive to lift all restrictions on long-term capital movements. The directive to lift all restrictions on short-term capital movements was enacted on 24 June 1988.

Of course the same problems occur while analyzing correlation coefficients between long-term interest rates. An additional problem is the question how to measure the degree of capital market integration without looking at stock markets. When the stock market integration is much smaller we would mistakenly conclude that the capital market integration had risen.

Long-term interest differentials

Table 8 shows the means and standard deviations of nominal long-term interest differentials of EC member states with respect to Germany during the period January 1981 to December 1990 and the sub-periods January 1981 to December 1985 and January 1986 to December 1990.

The Netherlands had the smallest nominal long-term interest differential with respect to Germany during the period January 1981 to December 1990, followed by Luxembourg, Belgium, The United Kingdom, France, Ireland, Denmark, Spain, Italy, Portugal, and Greece. Countries with a narrow band

TABLE 7 – CORRELATIONS AMONG REPRESENTATIVE NOMINAL LONG-TERM INTEREST RATES OF EC MEMBER STATES DURING THE PERIOD JANUARY 1981 TO DECEMBER 1990

	Ger	UK	Fra	NL	Ita	Bel	Ire	Spa	Den	Por	Gre	Lux
Ger	1.0000											
UK	0.8695	1.0000										
Fra	0.7954	0.8138	1.0000									
NL	0.9769	0.9153	0.8527	1.0000								
Ita	0.7572	0.7802	0.9591	0.8284	1.0000							
Bel	0.8632	0.8271	0.9529	0.8955	0.9331	1.0000						
Ire	0.6909	0.8372	0.9171	0.7618	0.8668	0.8655	1.0000					
Spa	0.7291	0.5062	0.7750	0.7173	0.7642	0.8064	0.5857	1.0000				
Den	0.7546	0.8250	0.9210	0.8298	0.8954	0.8781	0.9088	0.6238	1.0000			
Por	0.2200	0.1581	0.4774	0.2244	0.4533	0.5110	0.4464	0.5680	0.2391	1.0000		
Gre	0.1570	−0.0719	0.0976	0.0839	0.0176	0.0763	0.0831	0.3156	−0.0442	0.2686	1.0000	
Lux	0.4046	0.3945	0.6981	0.4480	0.7197	0.7129	0.6721	0.6152	0.6106	0.6922	0.0297	1.0000

Note: Correlations of Greece with EC member states during the period January 1982 to December 1988.

Source: see data appendix.

have lower nominal long-term interest differentials than countries with a broad band.

In Table 8 we also examine changes in the degree of capital market integration of EC member states by comparing the nominal long-term interest differentials of the sub-period January 1981 to December 1985 with the sub-period January 1986 to December 1990. The nominal long-term interest differential has unambiguously fallen. Capital market integration has considerably risen in the EC. Furthermore, the standard deviation of the nominal long-term interest differential declined in all EC countries except Ireland and Greece.

Moreover, it seems that capital market integration is higher than money market integration. Two factors may attribute to a higher degree of convergence at longer maturities. Firstly, following ERM entry, official interest rate changes were better anticipated than before. Secondly, ERM entry added cred-

TABLE 8 – NOMINAL LONG-TERM INTEREST DIFFERENTIALS OF EC MEMBER STATES RELATIVE TO GERMANY: MEANS AND STANDARD DEVIATIONS

	1981–1990	1981–1985	1986–1990
UK-Germany	3.22%	3.52%	2.93%
	(0.89)	(1.01)	(0.62)
France-Germany	4.32%	5.95%	2.68%
	(1.87)	(0.92)	(0.90)
The Netherlands-Germany	0.41%	0.73%	0.08%
	(0.52)	(0.54)	(0.19)
Italy-Germany	6.64%	9.01%	4.27%
	(2.82)	(1.90)	(1.00)
Belgium-Germany	2.70%	3.89%	1.51%
	(1.29)	(0.54)	(0.44)
Denmark-Germany	5.41%	7.44%	3.37%
	(2.99)	(2.86)	(1.20)
Ireland-Germany	4.94%	6.67%	3.22%
	(2.31)	(1.28)	(1.77)
Spain-Germany	6.61%	7.29%	5.93%
	(1.39)	(1.44)	(0.93)
Portugal-Germany	9.24%	10.56%	7.92%
	(2.70)	(3.10)	(1.22)
Greece-Germany	9.55%[1]	8.97%[2]	10.32%[3]
	(2.14)	(2.01)	(2.05)
Luxembourg-Germany	1.18%	1.32%	1.04%
	(1.34)	(1.55)	(1.07)

[1]During the period January 1982 to December 1988
[2]During the period January 1982 to December 1985
[3]During the period January 1986 to December 1988

Source: see data appendix.

ibility and policy discipline enabling interest rates to be cut without implying that inflation would necessarily rise (Sijben, 1990). Of course, above considerations depend on the degree of convergence of monetary policies in the EC. High nominal short-term interest differentials may also be explained by the use of the nominal short-term interest rate as a policy instrument to maintain the exchange rates in the allowed fluctuation margins of the EMS. To some extent, a *divergence* in short-term interest rates can help promote *convergence* in inflation and thus long-term interest rates. So it is difficult to distinguish the effect of financial integration on short-term interest rates from the effect of monetary policy.

5 CONCLUSIONS

This article analyses in a theoretical and empirical manner the degree of financial integration in the EC. Defining the concept of financial integration was important because the criteria within the quantity and the price approach measure different types of capital mobility. To obtain a more comprehensive perspective on the overall degree of financial integration in the EC and how this changes over time we used four criteria which differ with respect to their underlying assumptions.

Although the criteria do not always give the same results, it can be said in general that the degree of money and capital market integration in the EC increased in the 1980s. Moreover – in our article – the different criteria generally point to the same classification of EC member states *i.e.* those which are to a higher or lesser degree integrated. The financial markets of Germany, the United Kingdom, Luxembourg and The Netherlands are most integrated. This group is closely followed by Belgium, France, Denmark, Italy, and Ireland. Spain, Portugal and Greece have the least integrated financial markets.

DATA APPENDIX

GROSS NATIONAL SAVINGS, GROSS DOMESTIC INVESTMENT AND GROSS DOMESTIC PRODUCT

Data of gross national savings (S_t), gross domestic investment (I_t) and gross domestic product (Y_t) are taken from OECD (1991), National Accounts of OECD Countries, Main Aggregates 1960–1989, Volume I. Gross domestic investment or 'gross capital formation' is the sum of 'gross fixed capital formation' and 'increase in stocks.' Gross national savings is the sum of 'net saving' and 'consumption of fixed capital.' Adding up gross national savings and the 'surplus of the nation on current transactions' results apart from a 'statistical discrepancy' in 'finance of gross capital formation.' Gross domestic investment is financed by gross national savings and the surplus of the nation's current

REPRESENTATIVE NOMINAL SHORT-TERM INTEREST RATES

(The table summarizes the data of the representative nominal short-term interest rates of EC member states)

Country	Period	Description	Source
Germany	1/1981–12/1985	3-month interbank loans	OECD Financial Statistics Monthly
	1/1986–12/1990	3-month fibor	OECD Financial Statistics Monthly
UK	1/1981–12/1990	3-month interbank loans	OECD Financial Statistics Monthly
France	1/1981–12/1988	3-month pibor	OECD Main Economic Indicators, Historical Statistics 1969–1988
	1/1989–12/1990	3-month pibor	OECD Financial Statistics Monthly
The Netherlands	1/1981–12/1990	3-month loans to local authorities	OECD Financial Statistics Monthly
Italy	1/1981–12/1990	Interbank sight deposits	OECD Financial Statistics Monthly
Belgium	1/1981–12/1990	3-month treasury certificates	OECD Financial Statistics Monthly
Ireland	1/1981–12/1990	3-month treasury bills	OECD Main Economic Indicators
Spain	1/1981–12/1981	3-month interbank loans	OECD Main Economic Indicators, Historical Statistics 1969–1988
	1/198–12/1990	3-month interbank loans	OECD Financial Statistics Monthly
Denmark	1/1981–12/1985	call money	Comite des Gouverneurs/ Koerslijstje, IFS Call money
	1/1986–10/1988	3-month interbank rate	*Idem*
	11/1988–12/1990	3-month Eurorate	*Idem*
Portugal	1/1986–12/1990	Money market rate	IMF International Financial Statistics
Greece	1/1982–12/1986	Rate on 3-month treasury bills	Various supplement A of the periodical European Economy, data source EUROSTAT
	1/1987–12/1990	Rate on 3-month treasury bills	EUROSTAT Eurostatistics, data for short-term economic analysis

account. The 'statistical discrepancy' is assigned to the surplus of the current account of the balance of payments. Gross domestic product is taken at current prices. OECD calculations of S_t, I_t and Y_t of all EC member states except

REPRESENTATIVE NOMINAL LONG-TERM INTEREST RATES

(The table summarizes the data of the representative nominal long-term interest rates of EC member states. All long-term government bonds are traded in the secondary market)

Country	Period	Description	Source
Germany	1/1981–12/1990	7–15 year public sector bonds	OECD Financial Statistics Monthly
UK	1/1981–12/1990	20 year central government bonds	OECD Financial Statistics Monthly
France	1/1981–12/1990	Public and semi-public sector bonds	OECD Financial Statistics Monthly
The Netherlands	1/1981– 1/1984	Latest three long-term issues of central government bonds	OECD Financial Statistics Monthly
	2/1984–12/1990	5 longest running issues of central government bonds	OECD Financial Statistics Monthly
Italy	1/1981–12/1990	Treasury bonds with life between 2 and 3 years	OECD Financial Statistics Monthly
Belgium	1/1981–12/1990	Central government bonds	OECD Financial Statistics Monthly
Ireland	1/1981–12/1990	Government bonds (more than 5 years)	OECD Main Economic Indicators
Spain	1/1981–12/1983	Government bonds (more than 2 years)	OECD Main Economic Indicators, Historical Statistics 1969–1988
	1/1984–12/1990	Government bonds (more than 2 years)	OECD Financial Statistics Monthly
Denmark	1/1981–12/1990	Central government 4.5% bonds	OECD Financial Statistics Monthly
Portugal	1/1981–12/1990	Government bond yield	IMF, IFS databank
Greece	1/1982– 9/1984	Yield on a fixed interest government bond	Various supplement A of the periodical European Economy, data source EUROSTAT
	10/1984–12/1988	Yield on a fixed interest government bond	EUROSTAT Eurostatistics, data for short-term economic analysis
Luxembourg	1/1981–12/1990	Government bond yield	IMF, International Financial Statistics

Greece are based on definitions of the *Present* System of National Accounts (S.N.A.) of the United Nations. The calculations of Greece are based on an earlier system.

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Summary

THE DEGREE OF FINANCIAL INTEGRATION IN THE EUROPEAN COMMUNITY

Firstly, this study discusses four different definitions of international capital mobility. Furthermore, a theoretical and empirical analysis of the quantity and the price approach to financial integration is given. The empirical analysis is confined to the member states of the European Community. With regard to the price approach a distinction is made between integration of money markets and that of capital markets. Finally, the study draws some general conclusions based on the empirical research.